

--- VALIDATION AND ENDORSEMENT ---

END/FWD	END/CLS	RETURN	USER-ID	NAME	DATE
INVESTIGATOR:	X		KEA	LCDR M.KEARNEY	02MAY94
UNIT COMMAND:	X		GSCOPE	CAPT. G.S. COPE	28JUN94
DIST REQ? Y :	X		9860	LAMBOURNE, BOB G.	03AUG94
HQ REQ? Y :		X	SMA	S.M. ATKINSON	10AUG94

--- GENERAL INFORMATION ---

CITY/ NORFOLK ST/ VA WATERBODY/ ELIZABETH RIVER
RIVER MILE/ . LATITUDE/ N 36-50.2 LONGITUDE/ W 76-17.8
CAS SUMMARY:TYPE/ PERSON CAS CLASS/ SIGNIFICANT
POSSIBLE DRUG INVOLVEMENT?/ Y PUBLIC VESSEL/ X BOATING/
DEATHS/ 2 MISSING/ INJURED/ 6 TOTAL DAMAGE/
ENV IMPACT: MODE/ SEVERITY CATEGORY/ MATERIAL CATEGORY/
OSC/ EPA REGION/ CLEANUP REQ?/
RESPONSE BY NSF?/ NSF TIME TO RESPOND/ HOURS
NOTIFICATION FROM NRC?../ NRC CASE../
NOTIFICATION FROM APHIS?/ APHIS PORT/

--- INCIDENT BRIEF ---

LOW PRESSURE CO2 FIRE SUPPRESSION SYSTEM ACCIDENTLY DISCHARGED AGENT INTO THE ENGINE ROOM WHILE BEING TESTED FOR A CG INSPECTION. TWO PERSONS DIED OF ASPHYXIATION. FOUR OTHERS IN THE ENGINE ROOM WERE SLIGHTLY INJURED. TWO RESCUERS WERE ALSO INJURED. DECEASED PERSONS INCLUDED A COAST GUARD MARINE INSPECTOR AND A SUBCONTRACTOR. CAUSE DETERMINED TO BE AN IMPROPERLY REINSTALLED SHUT-OFF VALVE ALONG WITH A FAILURE TO FOLLOW ESTABLISHED SAFETY PROCEDURES.SEL

--- ACTIONS REPORTED ---

SEL	CASE SUPPLEMENTS	SEL	EVENT SUPPLEMENTS
1	WITNESS LIST.....(IAWL)/ X	14	COLLISION OR GROUNDING.(MCCG)/ 0
2	COMDT RECOMMENDATION.(MCCR)/ X	15	EQUIP FAILURE.....(MCDR)/ 1
3	CASUALTY DETAILS.....(MCDD)/ X	16	FLOOD,CAPSIZE,SINKING..(MCFC)/ 0
4	NARRATIVE SUPPLEMENT.(MCNS)/ X	17	FIRE,EXPLOSION.....(MCFE)/ 0
5	PERS ACTION RECOMMEND(MCPA)/ 0	18	HUMAN FACTORS SUPP.....(MCHF)/ 1
6	POLLUTANT DETAILS....(MCPD)/ 0	19	HAZ MAT INVOLVEMENT....(MCHM)/ 0
7	MARPOL DETAIL SUP....(MCMD)/ 0	20	LIFESAVING SUPPLEMENT..(MCLS)/ 0
8	OPERATIONAL CONTROLS (PSOC)/ 0	21	PERSONNEL CASUALTY.....(MCPC)/ 1
9	PERSONNEL INVOLVEMENT(MCPI)/ 1	22	STRUCTURAL FAILURE.....(MCSF)/ 0
10	SMI SUPPLEMENT.....(MCSI)/ 1		
11	TOWING SUPPLEMENT....(MCTS)/ 0		
12	SUBJECT SUPPLEMENT...(MCSS)/		
13	WEATHER FACTORS.....(MCWX)/		

-SUPPLEMENTS-

VESSELS INVOLVED/ 1
VIN NAME FLAG SERVICE P M F P P S TOW
D684097 CAPE DIAMOND US FREIGHT SHIP D D R A I I REF DMG
ENF ACTIONS: REQ LOU/ REQ SURETY BOND/ NONE/ X X NONE
(ENTER HERE IF ASSOCIATED WITH AN MC CASE, OTHERWISE RECORD IN PSAR)

FACILITIES INVOLVED/ 0

--- INVESTIGATION RESOURCES UTILIZED ---

ACTIVITY	TOTAL	RESOURCE CATEGORY			
CATEGORY	HOURS	REGULAR	RESERVE	CIVILIAN	OTHER

UNIT/ HMRMS
POLLUTION INVEST .0 .0 .0 .0 .0

CASUALTY INVEST	155.0	73.0	82.0	.0	.0
ADMIN	339.1	339.1	.0	.0	.0
TRAVEL	8.8	8.8	.0	.0	.0
TRAINING	.0	.0	.0	.0	.0

UNIT/ BALMS

POLLUTION INVEST	.0	.0	.0	.0	.0
CASUALTY INVEST	670.2	670.2	.0	.0	.0
ADMIN	17.4	17.4	.0	.0	.0
TRAVEL	42.0	42.0	.0	.0	.0
TRAINING	.0	.0	.0	.0	.0

UNIT/ 05M

POLLUTION INVEST	.0	.0	.0	.0	.0
CASUALTY INVEST	.0	.0	.0	.0	.0
ADMIN	28.0	28.0	.0	.0	.0
TRAVEL	.0	.0	.0	.0	.0
TRAINING	.0	.0	.0	.0	.0

UNIT/ GMMI

POLLUTION INVEST	.0	.0	.0	.0	.0
CASUALTY INVEST	.0	.0	.0	.0	.0
ADMIN	20.0	20.0	.0	.0	.0
TRAVEL	.0	.0	.0	.0	.0
TRAINING	.0	.0	.0	.0	.0

--- RELATED CASES ---

SEL	CASE	PORT	DATE	PARAMETERS	STATUS
23	MI93013644	HMRMS	30MAR93	OTHER	CLOSED
MCDD	MARINE CASUALTY DESCRIPTION DETAILS				17JAN96

CASE NUMBER/ MC93005885 ARE ALL SUPPLEMENTS COMPLETED?/ Y

--- SUBJECT REFERENCE MAP ---

REF	VIN	NAME	SERV OPERATION	CONTROL STATUS
1.	D684097	CAPE DIAMOND	FRTS RMM	MOORED
COMMENT/				

--- CASUALTY PROLOGUE ---

VALVE BOLTS INSTALLED IMPROPERLY, VALVE INDICATOR PLATE NOT REPLACED, VALVE NOT CHECKED FOR BINDING & PACKING, TEST SPACE NOT EVACUATED - ALL REQ BY MANUAL

--- CASUALTY EVENT SEQUENCE ---

EV	SUBJ'S	TYPE	CLASS	STATE	CAUSAL EVENTS
1	1	PERSONNEL CAS	DEATH	NEC	

CAT	SUBJ	CLASS	SUBCLASS	STATE	PARTY	CAUSAL SUP EVENT (X)
EF	1	FIRE FIGHTING	FIXED CO2	IMP REPR	PRI	X
HF	1	SIT ASSESSMENT	HAZARD WARNINGS	DISREGARDED	PRI	X

MCDR MARINE CASUALTY DEFICIENCY REPORT 17JAN96

CASE NUMBER/ MC93005885

EVENT	TYPE	CLASS	STATE
1	PERSONNEL CAS	DEATH	NEC
1. NAME/ CAPE DIAMOND		VIN/ D684097	

--- DEFICIENCY DEFINITION ---

IDENT.../ 1 DELETE/
 LOCATION/ UNCLASSIFIED TYPE/ IMP REPR CAUSE/ IMP INSTALL
 SYSTEM...../ FIRE FIGHTING
 SUBSYSTEM...../ FIXED CO2
 SUBSYSTEM ITEM...../ NEC
 DESCRIPTION FOR "NEC"/ CO2 TANK SHUT-OFF VALVE
 SUBCHAPTER Q NUMBER../ . /
 CATEGORY(X): MISSING-OUTDATED/ OPERATION-PROCEDURE/ X
 MATERIEL FAILURE/ NOT INSPECTED/ X

LEGAL ACTIONS POSSIBLE?/ N

SPEC/ DESC/

DESCRIPTION/

The bolts securing the aft CO2 tank shut-off valve to the discharge header were too long, interfering with the movement of the worm and sector mechanism which operates the valve, preventing it from closing.

Notify G-MVI/G-MTH of Equipment Failure IAW VOL II of the MSM.

COMMENT/

MCHF MARINE CASUALTY HUMAN FACTORS SUPPLEMENT 17JAN96

CASE/ MC93005885 PARTY/ PRI

1. VESSEL NAME/ CAPE DIAMOND VIN/ D684097

--- PERSONNEL PROFILE ---

AGE...../ HEIGHT/ SEX/ WEIGHT/

EDUCATION/ HS4 ATTENDED MARITIME ACADEMY?../ N

TYPE OF LICENSE OR DOCUMENT HELD/ NONE

TIME IN GRADE...../ YRS MONTHS

TIME ON BOARD PRESENT VESSEL..../ YRS MONTHS

TIME IN INDUSTRY...../ YRS MONTHS

TIME ON WATCH/ HRS LENGTH OF WATCH/ HRS NO. OF WATCHES PER DAY/

ADDITIONAL OFF-WATCH DUTIES ASSIGNED?/

TIME SPENT PERFORMING OFF-WATCH DUTIES..../ HRS

AMOUNT OF SLEEP IN PREVIOUS 24 HOUR PERIOD/ HRS

--- ADDITIONAL PERSONNEL PROFILE INFORMATION ---

The Lead Technician for the fire service company, he had been hired just a week before. He had had a "few hundred" experiences with shoreside low-pressure CO2 systems but he had never worked on shipboard L-P CO2 systems. He received considerable training in low-pressure systems in general while working for an individual in 1973. This was his first shipboard L-P CO2 system.

--- EVENT FACTORS ---

	TYPE	CLASS	STATE
EVENT/ 1	PERSONNEL CAS	DEATH	NEC
	CLASS	SUBCLASS	STATE

	CLASS	SUBCLASS	STATE
HUMAN FACTOR./	SIT ASSESSMENT	HAZARD WARNINGS	DISREGARDED
PERS ELEMENT/	MENTAL INFLUENC	COMPLACENCY	UNDERESTIMATED
PERS ELEMENT/	KNOWLEDGE/PROF	SYSTEM/EQUIP OPER	INADEQUATE
PERS ELEMENT/	KNOWLEDGE/PROF	RULES,REGS,POLICIES	NOT FOLLOWED
PERS ELEMENT/	MANAGEMENT	PERS QUALIFICATIONS	INADEQUATE
PERS ELEMENT/	MANAGEMENT	PERS TRAINING POLICY	INADEQUATE
MCNS	MARINE CASUALTY NARRATIVE SUPPLEMENT		17JAN96

CASE/ MC93005885 PORT/ BALMS SUBJECT/ M/V CAPE DIAMOND/CO2 DISCHA DATE/ 03MAR93

--- COMMENTS ---

A one-man formal investigation was convened by Commander, Fifth Coast Guard District. Ten days of hearings were conducted in the United States District Court House, Norfolk, Va. The final narrative report was sent to Commandant (G-MMI) via the Fifth Coast Guard District and due to its length will not be repeated here.

The record includes a 2652 page transcript, cassette recordings of the proceedings, two professionally produced videotapes, one documenting the removal of the suspect valve and the condition of the CO2 system following the casualty, the other documenting the testing of the valve.

Also included in the record are the exhibits listed in the transcript. These include photographs, manuals, and blueprints.

This case was reopened due to a request made via PR94000867 on 01APR94.

It was approved by LT M. JENDROSSEK (JGL). Please see comments below made by LT M. JENDROSSEK (JGL).

Case opened administratively for completion of recommendations supplements and routing endorsements.

CONCLUSIONS

The Cause of the Casualty

1. The cause of the casualty was the improper installation of the aft CO2 tank shutoff valve after servicing. The bolts securing the valve to the discharge header were too long and therefore interfered with the movement of the worm and sector mechanism which operates the valve, preventing it from closing.

2. Contributing to the casualty was the failure of the servicing technicians to follow the published procedure for testing the system. System manuals call for an inspection prior to a system test. The inspection includes a check of the tank shutoff valves to ensure that they are not leaking at the packing gland and that the worm and sector mechanism is not binding, both of which were the case in this instance. In addition, the manual cautions that the test be conducted by "qualified personnel" and that they, among other things, 1) clear with the personnel in charge before the test discharge and, 2) arrange for evacuation in the test discharge area. None of these procedures were followed.

3. Also contributing to the casualty was the failure of the servicing company to replace the plate indicating the open/closed position of the aft tank shutoff valve when they noticed it missing after the valve was reinstalled but prior to this test. The Lead Technician, who operated the valve during the casualty, the arrow on the sector points on the worm gear when the valve is closed. Based on the fact that the valve remained partially open, he was either mistaken in his knowledge or he did not look at the sector arrow when he determined that the valve was closed after charging the header for the puff test.

4. The failure of Hiller Systems, Inc. to provide training to its employees may have contributed to the casualty.

MCNS

MARINE CASUALTY NARRATIVE SUPPLEMENT

17JAN96

CASE/ MC93005885 PORT/ BALMS SUBJECT/ M/V CAPE DIAMOND/CO2 DISCHA DATE/ 03MAR93

--- COMMENTS ---

5. The failure of NORSHIPCO Ship's Superintendent to report the unlocked system to the Safety Department the week before the casualty may have contributed to the casualty.

6. The failure of the U.S. Coast Guard to adequately address low-pressure CO2 systems in its inspector training courses and in the Code of Federal Regulations, Marine Safety Manual, and Navigation and Inspection Circulars may have contributed to the casualty.

7. Other than the above, there is no evidence that any personnel of the Coast Guard or other government agency or any other person contributed to the casualty. There is no evidence that any act of misconduct, inattention to duty, negligence, incompetence, or willful violation of any law or regulation on the part of licensed or certificated personnel contributed to the casualty.

8. There is no evidence that the use of drugs or alcohol contributed to the casualty.

9. The HSI technicians did not intend to evacuate the machinery space nor did they make any attempt to verify that the Lead Inspector intended to do so. When the Lead Inspector left the CO2 control room on his way to the machinery space, there were no indications to the HSI technicians that he intended to evacuate the machinery space. This is reinforced by the fact that there were no subsequent telephone or other communications between the machinery space and the CO2 control room to verify the status of personnel in the space to be tested.

10. Both CO2 tank shutoff valves and bypass valves were in the fully closed positions just prior to flooding the header for the March 3 test.

11. In filling the header for the puff test, the Lead Technician opened the aft tank shutoff valve at least three turns, and most likely substantially more than that.

12. During the casualty and when it was realized that the aft tank shutoff valve must be open, the two HSI technicians, using a wrench, were able to free the sector quadrant from the flange bolts and close the valve.

13. CO2 discharge nozzles located in the main egress route from the machinery space may have hampered escape efforts.

14. Despite leaking face seals on their SCBAs caused by their beards, the Chief Mate and First Assistant Engineer entered the machinery space and were able to save the Third Assistant Engineer.

15. No conclusion can be drawn as to whether contractor's and shipyard personnel working in the machinery space, or for that matter, other protected spaces aboard CAPE DIAMOND were warned of the hazards associated with space protected by fixed CO2 systems as required by NFPA 12 section 1-6.1.3 since no

MCNS

MARINE CASUALTY NARRATIVE SUPPLEMENT

17JAN96

CASE/ MC93005885 PORT/ BALMS SUBJECT/ M/V CAPE DIAMOND/CO2 DISCHA DATE/ 03MAR93

--- COMMENTS ---

testimony was taken from them. It is apparent from his testimony that the MARAD Representative was not warned of such hazards prior to entering the machinery space. With the absence of more definitive testimony, it cannot be determined if the "lock-out" required by NFPA should have been implemented while workers who may have been unfamiliar with the ship, its CO2 system and operation, were working in the space. Similarly, there is no testimony as to precisely what these workers were doing.

16. Although the procedure for a puff test was explained to the Lead Inspector by the Lead Technician, he told the superintendent that there would be no discharge of CO2. Either the Lead Inspector misunderstood the explanation of the test or he did not consider a puff of CO2 to be a discharge.

17. Regulation and Coast Guard policy guidance are not clear with regard to who is responsible for conduction tests of fixed forfeiting systems. For example:

a) While 46 CFR 97.15-60 places the responsibility for performing tests on the owner, master, or person in charge,

b) 46 CFR 91.25-20 states "the inspector, at each inspection for certification, shall conduct (emphasis added) the following tests and inspections of fire-extinguishing systems." It does not say "witness", "oversee", or "observe".

c) The above seems to be contradicted by the Marine Safety School which teaches inspectors that, during and Inspection Certification, since 46 CFR 91.25-20 places the burden of insuring the adequacy of these systems on the inspector, he must witness (emphasis added) the servicing. The school's notes even underline the "must witness". They do not say "shall conduct".

d) Insuring adequacy of the system is also addressed in NVIC 6-72 which states that "owners often have service contracts with carbon dioxide manufacturers for maintenance of the system. A joint inspection is desirable, but does not relieve the Coast Guard of responsibility". The word "responsibility" is presumed here to mean responsibility for insuring the adequacy of the system.

e) The Marine Safety School also addresses the subject of manufacturer's representatives. Its notes, recognizing the complexities of low-pressure systems, encourage the OCMI to require a manufacturer's representative to service the system in lieu of high-pressure servicing personnel commonly available. The school also teaches that the manufacturer will have a test procedure which should be followed for the testing of time delays and sirens.

f) The Marine Safety Manual in discussing a casualty which occurred during the servicing of a high-pressure system, concludes that the inspector should ensure that adequate (safety) precautions are take during servicing. After carefully pondering the six statements above, a rational conclusion can be drawn. The owner is responsible for conducting the test and does so through the manufacturer's representative who is usually required by the OCMI. The marine
MCNS MARINE CASUALTY NARRATIVE SUPPLEMENT 17JAN96

CASE/ MC93005885 PORT/ BALMS SUBJECT/ M/V CAPE DIAMOND/CO2 DISCHA DATE/ 03MAR93

--- COMMENTS ---

inspector witnesses the tests, thus ensuring the adequacy of the system. It is implied that the inspector should ensure that the manufacturer's representative follow his own test procedure thus making sure that all components of the

system are tested and that the tests are conducted safely. The only contradictory statement among the six is the regulation requiring the inspector to conduct the tests.

18. Coast Guard inspectors were following Coast Guard directives and published guidance in conducting the inspection of the March 3, 1993 test.

19. Had the bypass valve been used for puff testing, the casualty would not have occurred.

20. Mr. Wysocki's opinion that the bypass valve is there to meet the NFPA's requirement of 40 pounds maximum force to operate the valve cannot be correct. First, as Mr. Bishoff states, the shutoff valve is not considered an operating device under NFPA. Second, torque is applied to a valve wheel. The amount of force necessary depends on the diameter of the valve handle. To facilitate easier operation, the valve wheel could have been made larger. Third, it is clear that the NFPA requirements of 40 pounds, 14 inches, are referring to a pull-cable operating device.

21. The method of puff testing by regulating the shutoff valve as described by Wysocki may be satisfactory for land-based installations, however it is too risky in a shipboard environment. Typically machinery spaces are large and deep, with many ladders, gratings, and obstructive pipes which would make rescue much more difficult than a system protecting a computer room or a building emergency generator room. Even when available, two-way radios may not operate reliable (with all the steel between the bilge and the CO2 control room) for this method to be used safely.

22. Had compressed air been used for the puff test, there would have been no loss of life. Testimony revealed that puff tests utilizing compressed air in the discharge header have been done in the past. While HSI maintained that it could no be done on CAPE DIAMOND's system, a subsequent puff test using a new servicing company was performed to a USCG inspector's satisfaction using compressed air.

23. Had those in the CO2 control room known that the system could be shut down in seconds using the lever at the manual actuating station, the loss of life may have been prevented. Upon recognizing that an emergency existed, it would have been much faster to shut the system down with the lever at the manual actuating station than by wrenching the valve shut.

24. The space being tested was not evacuated for the semiannual test. Both manuals require it. Two experts agree with this requirement and practice it themselves when testing.

25. MTL's agent, HSI, was responsible for conducting the CO2 system test which included ensuring that the spaces to be tested were evacuated. The MTL
MCNS MARINE CASUALTY NARRATIVE SUPPLEMENT 17JAN96

CASE/ MC93005885 PORT/ BALMS SUBJECT/ M/V CAPE DIAMOND/CO2 DISCHA DATE/ 03MAR93

--- COMMENTS ---

contract tasked HSI with proving the system operation the USCG. The Lead Technician was in charge and acted as such when he explained the test procedure to the Inspector and then again to the Lead Inspector.

26. In testing a particular space, other spaces protected by the CO2 system have a potential for an accidental discharge. Both experts agreed that ALL protected spaces should be evacuated prior to conducting a puff test of any one particular space. Selector valves give no external indication as to whether

they are open or closed. The selector valves are not as reliable in closing as they are in opening. The Navy study confirmed the opinions of the two experts in that Navy experience with low-pressure systems has shown that of seven incidents, four involved selector valves.

27. There was no ship's representative present to coordinate the CO2 test with other activities aboard the vessel. While the Chief Mate was present in the CO2 control room during the casualty, it was coincidental and he was not there specifically acting as a ship's representative for oversight purposes.

28. The Lead Technician was operating as an expert on the CO2 system and was in charge of conducting the test. The HSI technicians were not there just to respond to the direction of the inspector. Neither the Lead Technician nor the technician waited for the inspectors to instruct them on how the inspectors wanted the test done. This is further supported by HSI's cost breakdown to MTL which detailed the work to be performed, including, "test all actuation and alarm devices."

29. MTL was acting responsibly and within the guidelines of NFPA 12 in contracting with HSI, the system installation designer and an authorized Chemetron distributor, to conduct tests and inspections of the system.

30. The term "authorized Chemetron distributor" is misleading in that no training or expertise in Chemetron products is required to obtain that designation.

31. HSI did not ensure that the Lead Technician and the Technician had adequate training and exposure to shipboard low-pressure CO2 systems prior to servicing the CAPE DIAMOND's system.

32. HSI's quality assurance program relies too much on its customers' quality assurance. HSI's practice of relying on others (the prime contractor in this case) for quality assurance is dangerous in that customers may not have the expertise on such technical systems to be a judge of the quality of work has been done. Quality assurance in the case of CAPE DIAMOND consisted of NORSHIPCO's sign-off that the job was completed.

33. HSI relied on the USCG to be quality control for the ill-fated CAPE DIAMOND test. Despite all the warnings in manuals about thoroughly competent and specifically trained individuals, HSI sent a newly hired (7 days) technician to perform the test without ever having first supervised him in the proper conducting of such a test.

MCNS

MARINE CASUALTY NARRATIVE SUPPLEMENT

17JAN96

CASE/ MC93005885 PORT/ BALMS SUBJECT/ M/V CAPE DIAMOND/CO2 DISCHA DATE/ 03MAR93

--- COMMENTS ---

34. The improper setting of the safety relief valves did not contribute to this casualty.

35. While the details of the Lead Inspector's knowledge and experience with low-pressure systems is unknown, it is doubtful that he had any training other than on-the-job training. The Inspector's only exposure to low-pressure systems, a short discussion and a page of notes from the Marine Safety School was inadequate in that it did not result in a detailed understanding of the system or safety measures required in testing of the system. The purpose of this training seemed to be to impress upon inspectors the need to require technical experts in the testing of the system.

36. A requirement for a Coast Guard approved test procedure may have prevented this casualty. USCG inspectors witness tests on a variety of systems, some of them being very complicated such as boiler automation, inert gas, crude oil wash, propulsion automation, steering, vapor control systems, smoke detection systems, mobile offshore drilling rigs, and liquefied petroleum gas ships. Some systems, such as boiler automation and propulsion automation, require USCG approved test procedures (46 CFR Part 62 plus NVICs 1-69 and 6-84) to ensure that the system is tested completely and safely. Fixed CO2 fire protection systems currently do not require Coast Guard approved test procedures.

37. The inspection performed subsequent to the casualty illustrated that the system was in no way ready for Coast Guard inspection and, in fact, was in a condition which would have posed great danger to CAPE DIAMOND and her had she left the next day for sea trial in this condition. While HSI may maintain that they were not finished working on the system, it is a fact that they scheduled and were there to perform testing to prove the system to the USCG.

MCPC MARINE CASUALTY PERSONNEL CASUALTY SUPPLEMENT 17JAN96

CASE NUMBER...../ MC93005885 DELETE/
1. VESSEL NAME/ CAPE DIAMOND VIN/ D684097

SIG	EVENT	TYPE	CLASS	STATE
X	1	PERSONNEL CAS	DEATH	NEC

IPN...../ SSN/ 154 42 3451 MMD/ NO LICENSE/ NO
LAST NAME/ TUREK FIRST/ WILLIAM B., LCDR DOB..../ 26MAR48
ADDRESS../ USCG MARINE SAFETY OFFICE
200 GRANBY STREET
CITY...../ NORFOLK
UNITED STATES:
STATE../ VA ZIP/ 23510-1888
PHONE...../ 804-441-3302

STATUS/ GOVT EMPLOYEE SEX/ M CASUALTY TYPE: INJURED/ DEAD/ X MISSING/
DATE OF DEATH/ 03MAR93 INCAPACITATED OVER 72 HRS/ ON DUTY/ HRS ON DUTY/

TYPE OF ACCIDENT/ ASPHYXIATION EXPLANATION OF NEC/
RESULTING INJURY/ NOT ELSEWHERE CLASS BODY PT AFFECTED/ ENTIRE BODY
ACTIVITY...../ MARINE INSPECTOR CHECKING CO2 SIRENS AND ALARMS
LOCATION...../ MACHINERY SPACE
EQUIPMENT INV/ FIXED LOW-PRESS CO2 SPECIFIC EQUIP PART/ SHUT-OFF VALVE

--- DESCRIPTION ---

While in the machinery space to witness a test of the fixed low-pressure CO2 system by checking sirens, alarms, and nozzles, the space filled with CO2 as the test was being performed because the shut-off valve to the CO2 supply was not completely closed due to improper installation. SNM was found at the base of the exit ladder in an apparent attempt to escape. He could not be revived.

INJURED/DEAD PERSON'S EXPERIENCE:	YEARS	MONTHS
A. IN THIS INDUSTRY...../	8	9
B. WITH THIS COMPANY...../	20	8
C. IN PRESENT JOB OR POSITION/	2	8
D. ON PRESENT VESSEL/FACILITY/	0	4

INDUSTRY EMPLOYER: IPN...../ IP94007959
NAME...../ USCG MSO HAMPTON ROADS

MCPC MARINE CASUALTY PERSONNEL CASUALTY SUPPLEMENT 17JAN96

CASE NUMBER...../ MC93005885
1. VESSEL NAME/ CAPE DIAMOND

DELETE/
VIN/ D684097

SIG EVENT	TYPE	CLASS	STATE
X	1 PERSONNEL CAS	DEATH	NEC

IPN...../ SSN/ 154 42 5967 MMD/ NO LICENSE/ NO
LAST NAME/ HUMPHREYS FIRST/ PETER T. DOB..../ 17FEB49
ADDRESS../ 1842 TULANE ROAD

CITY...../ NORFOLK
UNITED STATES:
STATE../ VA ZIP/ 23518
PHONE...../

STATUS/ NEC SEX/ M CASUALTY TYPE: INJURED/ DEAD/ X MISSING/
DATE OF DEATH/ 03MAR93 INCAPACITATED OVER 72 HRS/ ON DUTY/ HRS ON DUTY/

TYPE OF ACCIDENT/ ASPHYXIATION EXPLANATION OF NEC/
RESULTING INJURY/ NOT ELSEWHERE CLASS BODY PT AFFECTED/ ENTIRE BODY
ACTIVITY...../ CONTRACTOR WORKING IN MACHINERY SPACE ON UNRELATED EQUIPMENT
LOCATION...../ MACHINERY SPACE
EQUIPMENT INV/ FIXED LOW-PRESS CO2 SPECIFIC EQUIP PART/ SHUT-OFF VALVE

--- DESCRIPTION ---

An employee of a private contractor, he was in the machinery space conducting vibration testing in preparation for upcoming dock trial. As others were conducting a test of the fixed low-pressure CO2 system alarms, the space began to fill with CO2. While his partner was able to escape, Humphreys was found in the machinery space and was not able to be revived.

INJURED/DEAD PERSON'S EXPERIENCE:	YEARS	MONTHS
A. IN THIS INDUSTRY...../	13	11
B. WITH THIS COMPANY...../	13	11
C. IN PRESENT JOB OR POSITION/	13	11
D. ON PRESENT VESSEL/FACILITY/	0	0

INDUSTRY EMPLOYER: IPN...../ IP94008117
NAME..../ VSE CORPORATION

MCPI MARINE CASUALTY PERSONNEL INVOLVEMENT SUPPLEMENT 17JAN96

CASE/ MC93005885 SUBJECT REF: CAPE DIAMOND D684097

SEL	IPN	NAME	ROLE	NATURE
	1. IP81001903	U.S. DEPT OF TRANS (MARAD)	OWNER	MANAGEMENT
	2. IP91011415	MARINE TRANSPORT LINES, INC.	OPERATOR	MANAGEMENT
	3. IP94008153	HILLER SYSTEMS, INC.	FIRE SERVICE	CONTRACT
	4. IP88926367	NORFOLK SHIPBUILDING & DRYDOCK	SHIPYARD	FACILITY
	5. IP94008183	MARINE DESIGN AND OPERATIONS	TECHNICAL REP	CONSULT
MCSI		MARINE CASUALTY SIGNIFICANT INCIDENT SUPPLEMENT		17JAN96

CASE/ MC93005885 SUBJECT REF: CAPE DIAMOND D684097

DELETE/

--- PERSONNEL INFORMATION ---

CG	CG	NEITHER	DRUG TEST	--- ALCOHOL TESTS ---
			URINE SPEC	BLOOD BREATH BREATH

NAME (LAST, FIRST)	LIC MMD			TAKEN	TAKEN	TAKEN	RESULTS
TUREK, WILLIAM	N	N	Y	Y	Y	N	
SMITH, KENNETH	N	N	Y	Y	N	N	
MUTH, WAYNE	N	N	Y	Y	N	N	
SPEARY, EDWARD	N	N	Y	Y	N	N	
MCCR	MARINE CASUALTY CASE RECOMMENDATION						17JAN96

CASE NUMBER/ MC93005885

UNIT/ BALMS

--- RECOMMENDATION ---

1. BRIEF/ CAPE DIAMOND CASUALTY ACTION PORT/ GMMI
Coast Guard inspectors be notified that "authorized Chemetron distributors" may or may not have factory training and certification.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X STATUS/ LAST UPDATE/ 24JUN94
I concur.

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y STATUS/ COMPLETE LAST UPDATE/ 09AUG94
COMMANDANT'S ACTION: We concur. The term "authorized dealer" does not necessarily imply training for any system, including CO2. This will be emphasized at the Marine Safety School.

L. H. GIBSON
By direction

MCCR MARINE CASUALTY CASE RECOMMENDATION

17JAN96

CASE NUMBER/ MC93005885

UNIT/ BALMS

--- RECOMMENDATION ---

2. BRIEF/ CAPE DIAMOND CASUALTY ACTION PORT/ GMMI
Coast Guard inspectors not witness tests on CO2 systems unless the persons conducting the tests establish and implement a written hazard communication program which meets the requirements of 29 CFR 1915-99(e)(2).

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X STATUS/ LAST UPDATE/ 24JUN94
I concur.

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y STATUS/ COMPLETE LAST UPDATE/ 09AUG94
COMMANDANT'S ACTION: We partially concur. Coast Guard inspectors should only work in places which fully comply with applicable OSHA standards. A hazard communication program would identify the physical hazards of CO2, but may not provide insight into the dangers of CO2 extinguishing systems. The Coast Guard inspector should not be responsible for checking shipyard compliance with OSHA regulations.

L. H. GIBSON
By direction

MCCR MARINE CASUALTY CASE RECOMMENDATION

17JAN96

CASE NUMBER/ MC93005885

UNIT/ BALMS

--- RECOMMENDATION ---

3. BRIEF/ CAPE DIAMOND CASUALTY ACTION PORT/ GMMI
The Coast Guard amend 46 CFR 91-25 as well as the corresponding parts of other subchapters to require the installation of a test fitting to the

discharge header on low-pressure CO2 systems so that compressed air can be used to puff test the system.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X STATUS/ LAST UPDATE/ 24JUN94
I partially concur. 46 CFR should require manufacturers to provide a means of testing the system without disassembling it, and without the danger of inadvertently placing the primary supply of CO2 on line for the test.

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y STATUS/ COMPLETE LAST UPDATE/ 09AUG94
COMMANDANT'S ACTION: We partially concur. Commandant (G-MTH) will initiate a rulemaking to amend 46 CFR 91.25-20, and the corresponding parts of other subchapters, to replace current language with basic performance criteria, stating that means must be provided to allow a test with a small quantity of agent or compressed air without disassembling the system. Manufacturers will be consulted as to the best way to modify these systems so that air tests can be performed.

L. H. GIBSON
By direction

MCCR MARINE CASUALTY CASE RECOMMENDATION 17JAN96

CASE NUMBER/ MC93005885 UNIT/ BALMS

--- RECOMMENDATION ---

4. BRIEF/ CAPE DIAMOND CASUALTY ACTION PORT/ GMMI
The Coast Guard enlarge 46 CFR Table 91.25-20(a)(2) as well as the corresponding parts of other subchapters to include both high and low-pressure CO2 systems.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X STATUS/ LAST UPDATE/ 24JUN94
I concur.

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y STATUS/ COMPLETE LAST UPDATE/ 09AUG94
COMMANDANT'S ACTION: We concur. The rulemaking discussed in recommendation 3 will include performance testing criteria for all types of fixed gas fire extinguishing systems.

L. H. GIBSON
By direction

MCCR MARINE CASUALTY CASE RECOMMENDATION 17JAN96

CASE NUMBER/ MC93005885 UNIT/ BALMS

--- RECOMMENDATION ---

5. BRIEF/ CAPE DIAMOND CASUALTY ACTION PORT/ GMMI
The Coast Guard rewrite 46 CFR 91.25-20(a) as well as the corresponding parts of other subchapters so as to clarify roles and responsibilities during fire extinguishing system tests and inspections.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X STATUS/ LAST UPDATE/ 24JUN94
I concur.

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y STATUS/ COMPLETE LAST UPDATE/ 09AUG94
COMADNANT'S ACTION: We concur. This will be included in the rulemaking

discussed in recommendation 3. However, the first step will be to expand on the inspector's role in the Marine Safety Manual.

L. H. GIBSON
By direction

MCCR

MARINE CASUALTY CASE RECOMMENDATION

17JAN96

CASE NUMBER/ MC93005885

UNIT/ BALMS

--- RECOMMENDATION ---

6. BRIEF/ CAPE DIAMOND CASUALTY

ACTION PORT/ GMMI

The Coast Guard update the Marine Safety Manual and NVIC 6-72 to include low-pressure fixed CO2 systems. Updated guidance should address safety concerns as well as roles and responsibilities of inspectors, vessel owners and agents with regard to testing, maintenance and servicing of CO2 systems.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X
I concur.

STATUS/

LAST UPDATE/ 24JUN94

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y

STATUS/ COMPLETE

LAST UPDATE/ 09AUG94

COMMANDANT'S ACTION: We concur. Commandant (G-MTH) will initiate a change to NVIC 6-72 and the Marine Safety Manual to include low pressure CO2 systems. This updated guidance will address safety concerns, roles and responsibilities of inspectors, vessel owners and agents during testing, inspection, maintenance and servicing of CO2 systems.

L. H. GIBSON
By direction

MCCR

MARINE CASUALTY CASE RECOMMENDATION

17JAN96

CASE NUMBER/ MC93005885

UNIT/ BALMS

--- RECOMMENDATION ---

7. BRIEF/ CAPE DIAMOND CASUALTY

ACTION PORT/ GMMI

The Coast Guard, as part of the type-approval of shipboard low-pressure CO2 systems, require one of the following means of isolating the system: a) a removable spool piece, b) a spectacle blind flange with a stop valve, or c) a double block valve system with a pressure bleed-off between the valves.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X

STATUS/

LAST UPDATE/ 24JUN94

I partially concur. System manufacturers should propose one or more means of isolating the system during a test. Such means may include those recommended, but should not be limited to them.

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y

STATUS/ COMPLETE

LAST UPDATE/ 09AUG94

COMMANDANT'S ACTION: We partially concur. The method for isolating the system should be worked out with the manufacturer. The three options listed in the recommendations may not be the only ones available. Additionally, the requirement for means of isolating the system should not be limited to low pressure systems and, in lieu of specifying methods of isolating the system, performance criteria should be used.

L. H. GIBSON
By direction

MCCR

MARINE CASUALTY CASE RECOMMENDATION

17JAN96

CASE NUMBER/ MC93005885

UNIT/ BALMS

--- RECOMMENDATION ---

8. BRIEF/ CAPE DIAMOND CASUALTY

ACTION PORT/ GMMI

The Coast Guard require all shipboard low-pressure CO2 systems to have USCG approved test procedures under 46 CFR 61.40-1(c) or similar regulations.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X
I concur.

STATUS/

LAST UPDATE/ 24JUN94

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y

STATUS/ COMPLETE

LAST UPDATE/ 09AUG94

COMMANDANT'S ACTION: We concur. Commandant (G-MVI) will ensure that the test procedures are part of the manual required for system approval.

L. H. GIBSON
By direction

MCCR

MARINE CASUALTY CASE RECOMMENDATION

17JAN96

CASE NUMBER/ MC93005885

UNIT/ BALMS

--- RECOMMENDATION ---

9. BRIEF/ CAPE DIAMOND CASUALTY

ACTION PORT/ GMMI

The Commandant of the Coast Guard recommend that OSHA review the contents of this investigation and consider modifying 29 CFR 1915 to more adequately address low-pressure CO2 systems with regard to the following: a) The entrance of workers into protected spaces not currently meeting annual testing requirements. b) Procedures for the isolation of the supply and delivery subsystems during testing and in conditions outlined in subparagraph (a) above. c) Evacuation of protected spaces or supply subsystems isolation during testing. d) Possible adoption of NFPA 12, Section 1-6.1.3, hazard awareness and warning of personnel entering protected spaces; requirements for trained personnel in evacuation situations. e) Possible adoption of NFPA 12, Section 1-6.1.4, predischage time delay to allow for evacuation under worst case shipyard versus routine conditions.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X
I concur.

STATUS/

LAST UPDATE/ 24JUN94

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y

STATUS/ COMPLETE

LAST UPDATE/ 09AUG94

COMMANDANT'S ACTION: We partially concur. Commandant (G-MMI) will forward a copy of this casualty report to OSHA. We have previously sent the proposed 29 CFR 1915 modifications to OSHA via our involvement with the OSHA Shipyard Employment Standards Advisory Committee.

L. H. GIBSON
By direction

MCCR

MARINE CASUALTY CASE RECOMMENDATION

17JAN96

CASE NUMBER/ MC93005885

UNIT/ BALMS

--- RECOMMENDATION ---

10. BRIEF/ CAPE DIAMOND CASUALTY

ACTION PORT/ GMMI

The Coast Guard amend 46 CFR Part 16 to require anyone who maintains,

services, or tests fixed shipboard CO2 fire protection systems be subjected to Department of Transportation drug testing requirements. While there is no evidence of use of illegal drugs in connection with this casualty, the investigation has shown the importance of the job performed by these personnel as well as the possible consequences of their actions.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X STATUS/ LAST UPDATE/ 24JUN94
I do not concur. Employees of fire protection equipment servicing companies are in the same status as shipyard workers or other outside contractors. They do not serve aboard the vessels they service, and are not considered transportation workers subject to drug testing under 49 CFR.

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y STATUS/ COMPLETE LAST UPDATE/ 09AUG94
COMMANDANT'S ACTION: We do not concur. Current statutes are intended to exclude drug users and violators of drug statutes from serving on U.S. merchant vessels. Persons who maintain, service or test fixed shipboard CO2 fire protection systems do not serve on the vessels. They are similar to other shoreside contractors brought aboard vessels such as diesel engine, gyrocompass, or electronics specialists. These individuals perform important functions on the vessel, but the responsibility for the safety of the vessel remains with the vessel's crewmembers.

L. H. GIBSON
By direction

MCCR MARINE CASUALTY CASE RECOMMENDATION 17JAN96

CASE NUMBER/ MC93005885 UNIT/ BALMS

--- RECOMMENDATION ---

11. BRIEF/ CAPE DIAMOND CASUALTY ACTION PORT/ GMMI
The Coast Guard consider shipboard fixed CO2 fire protection system servicing contractors similar to life raft inspection service companies in that factory training and Coast Guard oversight be required.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X STATUS/ LAST UPDATE/ 24JUN94
I partially concur. The Coast Guard should require proof of training and certification of servicing personnel, but should not exercise oversight of same.

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y STATUS/ COMPLETE LAST UPDATE/ 09AUG94
COMMANDANT'S ACTION: We do not concur. The Coast Guard should require proof of familiarity with CO2 systems, such as documentation of training from the manufacturer, but should not certify service facilities or companies.

L. H. GIBSON
BY Direction

MCCR MARINE CASUALTY CASE RECOMMENDATION 17JAN96

CASE NUMBER/ MC93005885 UNIT/ BALMS

--- RECOMMENDATION ---

12. BRIEF/ CAPE DIAMOND CASUALTY ACTION PORT/ GMMI

The Coast Guard amend 46 CFR 97.13-10 to require crewmembers assigned to Watch Quarter and Station Bill positions where they would be expected to don SCBAs in the event of an emergency to be clean-shaven.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X STATUS/ LAST UPDATE/ 24JUN94
I partially concur. Crewmembers required by their Watch Quarter and Station Bill positions to don SCBA equipment in an emergency should be able to use the equipment within its design parameters - whether they are clean shaven or not.

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y STATUS/ COMPLETE LAST UPDATE/ 09AUG94
COMMANDANT'S ACTION: We partially concur. Commandant (G-MTH) will initiate a rulemaking to amend 46 CFR 97.13-10, and corresponding parts of other subchapters, to require that any crewmember expected to wear SCBA's because of their watch quarter and station bill assignments, be able to wear them in such a way as to not interfere with the SCBA's designed function.

L. H. GIBSON
By direction

MCCR MARINE CASUALTY CASE RECOMMENDATION 17JAN96

CASE NUMBER/ MC93005885 UNIT/ BALMS

--- RECOMMENDATION ---

13. BRIEF/ CAPE DIAMOND CASUALTY ACTION PORT/ GMMI
The Coast Guard distribute Marine Safety Office Hampton Roads' Safe Work Practice dated 15 March 1993 to other Marine Safety/Marine Inspection Offices as a good example of a compressed gas extinguishing system inspection safe work practice.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X STATUS/ LAST UPDATE/ 24JUN94
I concur.

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y STATUS/ COMPLETE LAST UPDATE/ 09AUG94
COMMANDANT'S ACTION: We partially concur. A safe work practice has already been promulgated by Commandant (G-K), and a more detailed work practice was added as an inspection advisory note in MSIS by Commandant (G-MVI).

L. H. GIBSON
By direction

MCCR MARINE CASUALTY CASE RECOMMENDATION 17JAN96

CASE NUMBER/ MC93005885 UNIT/ BALMS

--- RECOMMENDATION ---

14. BRIEF/ CAPE DIAMOND CASUALTY ACTION PORT/ GMMI
The Coast Guard expand the syllabus at the Marine Safety School to include more thorough training in shipboard low-pressure CO2 systems.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X STATUS/ LAST UPDATE/ 24JUN94
I concur.

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y STATUS/ COMPLETE LAST UPDATE/ 09AUG94

COMMANDANT'S ACTION: We concur. This has already been completed. The Marine Safety School was tasked with changing their curriculum to be more detailed in the test and inspection of low-pressure CO2 systems and fixed systems in general.

L. H. GIBSON
By direction

MCCR

MARINE CASUALTY CASE RECOMMENDATION

17JAN96

CASE NUMBER/ MC93005885

UNIT/ BALMS

--- RECOMMENDATION ---

15. BRIEF/ CAPE DIAMOND CASUALTY ACTION PORT/ GMMI
The Coast Guard modify its regulations and policy to prohibit anyone from disregarding CO2 system alarms, even during tests. Spaces should be evacuated during alarm tests. Otherwise, any miscommunication as to the status of alarms and tests can result in possible serious injury or death. It is more prudent to simply evacuate a space during an alarm test. This stipulation should apply to high-pressure systems as well as low-pressure. Some personnel may not receive the notification when the alarm is back in effect, thereby ignoring a real warning of discharge. As an analogy, no one would think of pointing a gun at someone else even if they had verified that it was not loaded.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X STATUS/ LAST UPDATE/ 24JUN94
I partially concur. Standard testing procedures incorporating the evacuation of personnel from tested spaces should be established. Procedures should specify appropriate safety measures in the event that personnel are required to be in a space undergoing tests.

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y STATUS/ COMPLETE LAST UPDATE/ 09AUG94
COMMANDANT'S ACTION: We partially concur. The test procedures need to be standardized and clarified. Commandant (G-MVI) will work with Commandant (G-MTH) on a change to the Marine Safety Manual and NVIC 6-72, which will require that the protected space(s) be evacuated prior to a fixed gas extinguishing system test unless suitable safeguards are in place. Such safeguards would include isolation of the fixed gas supply or provision of breathing apparatus to personnel remaining in the space. The Coast Guard cannot prohibit the disregarding of alarms.

L. H. GIBSON
By direction

MCCR

MARINE CASUALTY CASE RECOMMENDATION

17JAN96

CASE NUMBER/ MC93005885

UNIT/ BALMS

--- RECOMMENDATION ---

16. BRIEF/ CAPE DIAMOND CASUALTY ACTION PORT/ GMMI
Copies of this report be forwarded to the National Fire Protection Association; Naval Sea Systems Command, Fire Protection Division; the Occupational Safety and Health Administration; and Chemetron Fire Systems Inc.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X STATUS/ LAST UPDATE/ 24JUN94
I concur.

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y STATUS/ COMPLETE LAST UPDATE/ 09AUG94
COMMANDANT'S ACTION: We concur. Commandant (G-MMI) will distribute this
report.

L. H. GIBSON
By direction

MCCR MARINE CASUALTY CASE RECOMMENDATION 17JAN96

CASE NUMBER/ MC93005885 UNIT/ BALMS

--- RECOMMENDATION ---

17. BRIEF/ CAPE DIAMOND CASUALTY ACTION PORT/ GMMI
The contents of this investigation be given wide dissemination throughout
the marine and shipyard industries.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X STATUS/ LAST UPDATE/ 24JUN94
I concur.

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y STATUS/ COMPLETE LAST UPDATE/ 09AUG94
COMMANDANT'S ACTION: We concur. We will develop an article for
Proceedings of the Marine Safety Council addressing the issues and proposed
resolutions regarding this casualty. Commandant (G-MMI) will distribute
copies of this report to all District(m) offices for their dissemination to
all Marine Safety field units.

L. H. GIBSON
By direction

MCCR MARINE CASUALTY CASE RECOMMENDATION 17JAN96

CASE NUMBER/ MC93005885 UNIT/ BALMS

--- RECOMMENDATION ---

18. BRIEF/ CAPE DIAMOND CASUALTY ACTION PORT/ GMMI
This case be closed.

--- UNIT ENDORSEMENT ---

ENDORSEMENT COMPLETE/ X STATUS/ LAST UPDATE/ 24JUN94
I concur.

--- HEADQUARTERS ENDORSEMENT ---

ENDORSEMENT COMPLETE/ Y STATUS/ COMPLETE LAST UPDATE/ 09AUG94
COMMANDANT'S ACTION: We concur.

L. H. GIBSON
By direction